

## Chapter 8. Environmental Consequences

This chapter contains an analysis of potential impacts that would result from the implementation of the recommended alternative, including the six-lane cross section and the hybrid Alternative G for the interchange at US Route 1 and Russell Road. Unless otherwise indicated, impacts are estimates based on the proposed typical section of the recommended alternative, but will likely increase as design progresses and when more detailed survey is available.

### 8.1 Land Use

The project would require land from Locust Shade Park, Marine Corps Base (MCB) Quantico, and the Marine Corps Heritage Center. However, the extent of the encroachment into these properties would not substantially change the land use designation or characterization. The Boswell's Corner area consists of generally shallow parcels adjacent to the roadway. Due to the configuration of the parcels, many of these businesses and residences would potentially need to be relocated or eliminated. Stafford County has recognized this need in their Master Redevelopment Plan for Boswell's Corner which envisions new residential and commercial growth in addition to a six-lane US Route 1 with a connected grid of minor streets. While none of these parcels have been recommended eligible for the National Register of Historic Places (NRHP), some of these parcels are properties that are historically and culturally relevant to the community (Stafford County Master Redevelopment Plan, 2009). The recommended six-lane section of US Route 1 is consistent with the Boswell's Corner Plan as well as the Comprehensive Plans of Prince William and Stafford Counties.

### 8.2 Farmland

Approximately nine acres of prime farmland and 23 acres of farmland of statewide importance is present within the Project area (**Figure 2-15**). Some of this has already been converted to non-agricultural use, but the majority would be permanently converted to non-agricultural use as a result of the Project.

Further coordination with the United States Department of Agriculture (USDA) and the Natural Resources Conservation Service (NRCS) would be required to develop mitigation strategies for potential impacts to prime farmland and farmland of statewide importance.

### 8.3 Water Resources

#### 8.3.1 Wetlands

**Table 8-1: Potential Impacts to Wetlands and WOUS within Study Area by Type**

Type	Identified Within Study Area	Potential Project Impacts
PFO	26.96 ac	5.8 ac
PSS	4.78 ac	0.9 ac
PEM	1.55 ac	0.7 ac
POW	0.53 ac	0.3 ac
<b>Total Wetlands</b>	<b>33.82 ac</b>	<b>7.8 ac</b>
Streams	5335 LF	1920 LF

According to **Table 8-1**, the Project would result in potential impacts to approximately 1920 linear feet of streams, as well as up to approximately eight acres of wetlands (**Figure 2-16**). The majority of potential wetland impacts would be due to the raised profile of the roadway, which is necessary to avoid the 100-year floodplain. The raised profile would require installation of side slopes and guardrails. However, impacts to wetlands may be minimized by the use of retaining walls rather than side slopes, which would reduce the total wetland impacts to approximately three acres. A detailed alternatives analysis is necessary to evaluate the costs and benefits of retaining walls.

The wetland delineation of the study area has not been submitted to the US Army Corps of Engineers (USACE) for a wetland delineation confirmation. Upon submittal of the wetland delineation, the USACE will conduct a site visit to confirm the limits of wetlands and Waters of the United States (WOUS). The USACE will issue a jurisdictional determination (JD), which would be valid for a period of five years from the date of issuance. Proposed wetland impacts exceed two acres and would require Individual Permits from both USACE and the Virginia Department of Environmental Quality (DEQ). After plans are developed, a Joint Permit Application (JPA) would be prepared, describing the proposed physical alteration of surface waters, the specific acreage and linear feet of proposed impacts, and any alternatives considered to avoid or minimize impacts to wetlands and surface waters to the maximum extent practicable. Unavoidable impacts would require extensive justification. A functional values assessment of wetlands proposed for impact would be required in an application for impacts exceeding one acre of wetlands.

The DEQ and USACE typically require compensatory mitigation at a 2:1 ratio for palustrine forested (PFO) wetland impacts, a 1.5:1 ratio for palustrine scrub-shrub wetland (PSS) impacts, and a 1:1 ratio of palustrine emergent wetland (PEM) impacts, although higher ratios can be required for certain wetland systems. The agencies would also require an assessment of the streams to be impacted using the Unified Stream Methodology (USM) issued jointly by the USACE and DEQ on January 18, 2007. The USM is used to evaluate the current stream condition, severity of proposed impacts, and the required compensatory mitigation for stream impacts. Typically, stream compensation is required at a 1:1 up to a 1.5:1 ratio for stream impacts.

The DEQ will require the draft individual permit to be announced through a public notice in a local newspaper followed by a 30-day public comment period. The USACE will also have a public notice and comment period of up to 30 days. An individual permit may take between six months and one year for issuance from the submittal of a complete application.

Since the USACE will require an Individual Permit for the project impacts to wetlands, a Coastal Zone Management Consistency determination will also be required from DEQ. This consistency review will be undertaken concurrently with the review of the JPA and may take up to six months.

### **8.3.2 Floodplains**

The Project would result in potential impacts to approximately 18 acres of 100-year floodplains (**Figure 2-16**). A floodplain analysis would be required, and coordination with Prince William and Stafford Counties, VDOT, and the Virginia Department of Conservation and Recreation (DCR) would be necessary. Strict adherence to erosion and sediment controls is encouraged to minimize impacts to surface waters and water quality.

### **8.3.3 Chesapeake Bay Preservation Act**

The project would result in four crossings of Resource Protection Areas (RPAs) as mapped by the localities, with a total of approximately 12 acres of impact (**Figure 2-16**). Although linear transportation projects are exempt from CBPA regulations, associated stormwater management facilities are not exempt. Throughout the design process, any stormwater management facilities should be placed outside of RPA boundaries to the maximum extent practicable. Further coordination with localities should be conducted to determine if a site-specific RPA determination will be required. Water quality treatment measures would be incorporated into the project to ensure that stormwater runoff meets state stormwater management criteria. Strict adherence to erosion and sediment controls is encouraged to minimize impacts to surface waters and water quality.

### **8.4 Wildlife and Habitat**

A total of approximately nine acres of the MCB Quantico Protected Natural Area (PNA) directly adjacent to US Route 1 and the interchange at Russell Road would be directly impacted by the project (**Figure 2-17**). The most substantial impact would occur at the southeast quadrant of the intersection of US Route 1 and Russell Road due to the proposed interchange ramp. However, the remaining potential impacts are directly adjacent to existing roadways and interchange ramps. Therefore, it is anticipated that the Project would not substantially alter the function, use, or quality of the PNA as a wildlife habitat. Further coordination with MCB Quantico and DCR would be required to determine the scope of impacts to the PNA. Strict adherence to erosion and sediment controls is encouraged to minimize impacts to aquatic habitats.

Based on habitats observed within the study area during the field reconnaissance, unconfirmed state threatened and endangered species with potential habitats include the peregrine falcon (*Falco peregrinus*) and loggerhead shrike (*Lanius ludovicianus*). Both of these species can thrive in a wide variety of habitats, several of which are present within the study area. Further coordination with the Virginia Department of Game and Inland Fisheries (DGIF), including possible field studies, would be necessary to adequately determine impacts to these species. DGIF would require a submittal including the Initial Project Assessment report, a project location map, a description of the project scope, and representative photographs of the study area. In addition, DGIF recommends that a stream crossing table be provided, with the name, location, description of stream and wetland crossing characteristics and corresponding photographs for each crossing.

No bald eagle nests (*Haliaeetus leucocephalus*) were identified within 660 feet of the Project area. The project area does not intersect with a bald eagle concentration area. Therefore, no impacts to this species are anticipated.

Field reviews have revealed several areas within the Project area that fit the description for "suitable habitat" for the federally-endangered harperella (*Ptilimnium nodosum*) and the federally-threatened, state-endangered small whorled pogonia (*Isotria medeoloides*). Therefore, United States Fish and Wildlife Service (USFWS) would require species surveys conducted by an approved wildlife biologist listed on the USFWS website. Subsequently, a completed Project Review Request would need to be submitted to the Virginia Field Office of USFWS using the online Project Review application.

## 8.5 Historic Resources

**Table 8-2** in Section 4(f) and 6(f) below describes each architectural and archaeological site within the Area of Potential Effect (APE) and potential impacts to these resources as a result of the project (**Figure 2-17**). Due to the distance from the project area and the extensive tree cover, no impacts to the Kings Highway site are anticipated. The project would potentially have an adverse impact on the Iwo Jima Memorial statue, possibly requiring its relocation. One previously recorded archaeological site, located along US Route 1 south of Russell Road, has already been determined to be eligible for the NRHP. The recommended widening and interchange improvements at Russell Road would impact approximately 0.2 acres of the Lithic Workshop site (VDHR# 44PW1226) south of Russell Road, which would most likely lead to a determination of an adverse effect. While the Waugh's Purchase Cobble Quarry site (VDHR# 44PW1288) is not directly within the project area, its close proximity to Russell Road may result in a future constructive use. Approximately 0.3 acres of an unnamed site (VDHR# 44PW0912) would be impacted by the recommended interchange improvements at Russell Road.

Possible avoidance strategies are discussed in Section 4(f) and 6(f) below. The APE was not developed in consultation with DHR and is subject to approval. Any encroachment of the Project outside of the APE may require additional studies and consultation with DHR. Recommendations of eligibility and anticipated effects are also as yet unconfirmed by DHR. Prior to construction, DHR's concurrence on the recommendations of eligibility in the Architectural and Archaeological Resources reports must be secured. Subsequently, a Project Review package pursuant to Section 106 would need to be prepared to assess the project's effects to historic properties. DHR would then be consulted to develop and execute a Memorandum of Agreement enumerating ways to avoid, minimize, or mitigate any adverse effects to historic properties discussed above.

## 8.6 Parks and Recreation

Acres of potential impacts to the recreational and park resources are displayed in **Table 8-2** under Section 4(f) below. The Project would require between one and 30 feet of right-of-way and/or easements from Locust Shade Park and the Marine Corps Heritage Center in areas directly adjacent to the Project area (**Figure 2-17**). These potential impacts would not alter the use, access, or intended purpose of these resources. To avoid permanent impacts to the Virginia Birding and Wildlife Trail and access road, it is recommended that the entrance to the access road from US Route 1 is maintained. Every effort would be made during construction to maintain access to and function of the Trail.

## 8.7 Section 4(f) and 6(f)

Resources within the Project area that qualify or potentially qualify for protection under Section 4(f) include the following:

**Table 8-2: Section 4(f) and Historic Resources**

Resource	Description	Section 4(f)	Acres Within Project Area
076-5433	Iwo Jima Memorial statue, est. 1951	Recommended Eligible under Criterion A (pending DHR confirmation)	0.2
076-5195	North Kings Highway Road Section	Recommended Eligible (pending DHR confirmation)	None
44PW1226	Lithic Workshop	Eligible under Criterion D	0.2
44PW1288	Waugh's Purchase Cobble Quarry	Recommended Eligible under Criterion D (pending DHR confirmation)	Pending Further Design
44PW0912	Archaeological site	Recommended Eligible under Criterion D (pending DHR confirmation)	0.3
Marine Corps Heritage Center	Federally owned	Potential (pending 4(f) evaluation)	1.3
MCB Quantico Protected Natural Area	Federally owned wildlife protection area	Potential (pending 4(f) evaluation)	8.6
Virginia Birding and Wildlife Trail - Prince William Loop	driving trail highlighting wildlife areas; locality-owned, state-managed	Yes	temporary construction impacts; access must be restored post-construction
Locust Shade Park	sports, boating, leisure; owned by Prince William County	Yes	2.4

To avoid or minimize impacts to the Iwo Jima Memorial statue (VDHR# 076-5433) in the southeast quadrant of US Route 1 and Fuller Road, the roadway could be widened to the west. However, altering the alignment of the Project in this manner would adversely impact the Marine Corps Heritage Center, another resource that potentially qualifies for protection under Section 4(f). The use of land from the Heritage Center along US Route 1 would not substantially alter the function and purpose of the Center, whereas use of land associated with the Iwo Jima Memorial statue would result in substantial adverse effects to and possible relocation of the statue and surrounding pathways.

Since several properties within the Project area have not been confirmed to qualify for protection under Section 4(f), additional coordination with the agencies having jurisdiction over the respective properties would be required to verify eligibility of Section 4(f) resources within the Project area, to determine the use of those properties, and develop mitigation strategies. Any additional historic sites determined to be eligible for listing on the NRHP or listed on the NRHP would also be protected under Section 4(f).

No Section 6(f) resources were identified within the Project area. Therefore, no impacts to Section 6(f) resources would occur.

### **8.8 Community Facilities and Services**

Aside from the Section 4(f) sites discussed above, no other community facilities, including police stations, fire and rescue stations, hospitals, commuter lots, libraries, or public schools would be impacted by the project. It is recommended that provisions be made to maintain fire, police, and emergency response times during construction and overall.

### **8.9 Air Quality**

The recommended improvements to US Route 1, including the interchange with Russell Road, would reduce vehicle stoppage and idling time, the most substantial source of emissions. However, the increase in vehicle capacity would result in increased overall emissions.

Given that preliminary engineering of the Project is included in the VDOT Fredericksburg Region Six-Year Transportation Improvement Program (TIP), it can be assumed that the Project has been evaluated for regional air quality conformity. It is anticipated that a quantitative air quality analysis will be required.

The temporary air quality impacts from construction are not expected to be significant. Construction activities, after more detailed design occurs, are to be performed in accordance with VDOT's current "Road and Bridge Specifications." The Specifications conform with the State Implementation Plan and require compliance with applicable local, state, and federal regulations.

### **8.10 Noise**

A field study of the anticipated noise impacts on the properties mentioned in Section 2.2.10 (**Figure 2-18**) will be required as part of the noise analysis. If traffic noise impacts to these sensitive receptors are anticipated, the noise analysis must evaluate alternative abatement measures such as noise barriers for feasibility and reasonableness.

### **8.11 Environmental Justice**

Due to the minimal improvements proposed north of Joplin and Fuller Road, no impacts to Census Tracts 9009.01, 9009.05, and 9010.01 are anticipated. Census Tracts 101.08 and 102.07 contain environmental justice populations that would potentially be impacted by the Project (**Table 2-8**, Section 2.2.11; **Figure 2-18**).

All existing cross streets throughout the Project corridor would continue to have direct access to US Route 1. However, the addition of a median would remove direct access to US Route 1 via left turns from individual driveways. The access changes would affect both minority/low-income populations and non-minority/low-income populations.



The Project would require right-of-way from several businesses and residences, potentially requiring full property acquisitions and relocations of some properties within minority and/or low-income areas. However, right-of-way impacts would also affect non-minority/low-income populations.

Several residential areas and one hotel within Census Tract 102.07 and 101.08 are located within a noise-sensitive distance of the project area. However, there are also several residential areas and other noise receptors within a noise-sensitive distance of the project area that are not in minority or low-income areas.

Impacts would be borne equally by all populations throughout the corridor and not exclusively minority or low-income populations. Therefore, impacts to minority and low-income populations are not anticipated to be disproportionately adverse.

### **8.12 Hazardous Materials**

The Project would require right-of-way acquisition from properties throughout the corridor. According to GIS shapefiles from DEQ and the counties, approximately seven of the properties within the Project area contain potential Recognized Environmental Conditions (RECs). A full Phase I Environmental Site Assessment (ESA) per American Society for Testing and Materials (ASTM) standards would be required for all property acquisitions. In areas where suspected soil or groundwater contamination may be encountered, soil and groundwater testing may be warranted.

### **8.13 Conclusion**

The Project proposes potential impacts to prime farmland and farmland of statewide importance; some wetlands and surface waters, particularly around the US Route 1/Russell Road interchange; 100-year floodplains; Chesapeake Bay Protection Act (CBPA) mandated Resource Protection Areas; architectural and archaeological resources that are eligible for listing on the NRHP; and parks and recreational facilities. Further studies are required to determine impacts related to wildlife and habitat, endangered species, air quality, noise, and hazardous materials. No impacts to community services and facilities are anticipated.